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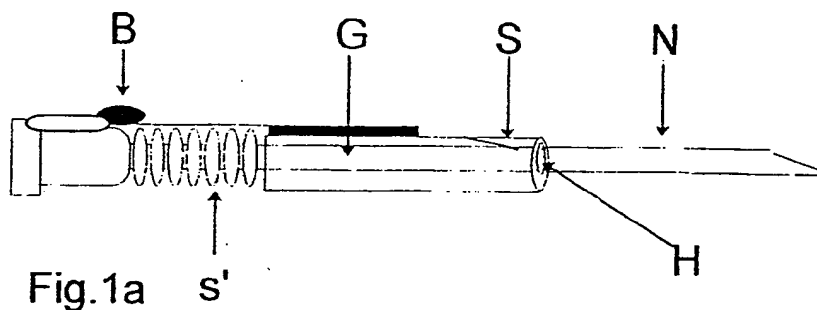
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(56) Documents Cited  
GB 2262451 A GB 2252046 A WO 90/07349 A1  
US 5181524 A US 3884230 A

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INT CL<sup>5</sup> A61M 5/32  
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(54) The integral hypodermic needle guard

(57) The integral hypodermic needle guard is a device either produced as a component of a hypodermic needle or one that can be attached to the needle prior to its use. The guard can be used immediately afterwards to cover the hypodermic needle tip and render the needle tip safe. An example is described of a guard G connected to the hub of the needle N by a coiled spring S'. After the needle is removed from the skin the operator releases the coiled spring which is compressed by a locking device (L, Fig. 2b) by depressing button B and extends the guard over the end of the needle. The needle tip is forced into a cleft between the wall of the guard and its end by a straight spring S in the base of the guard. The guard is maintained in position by the force of the extended coiled spring.



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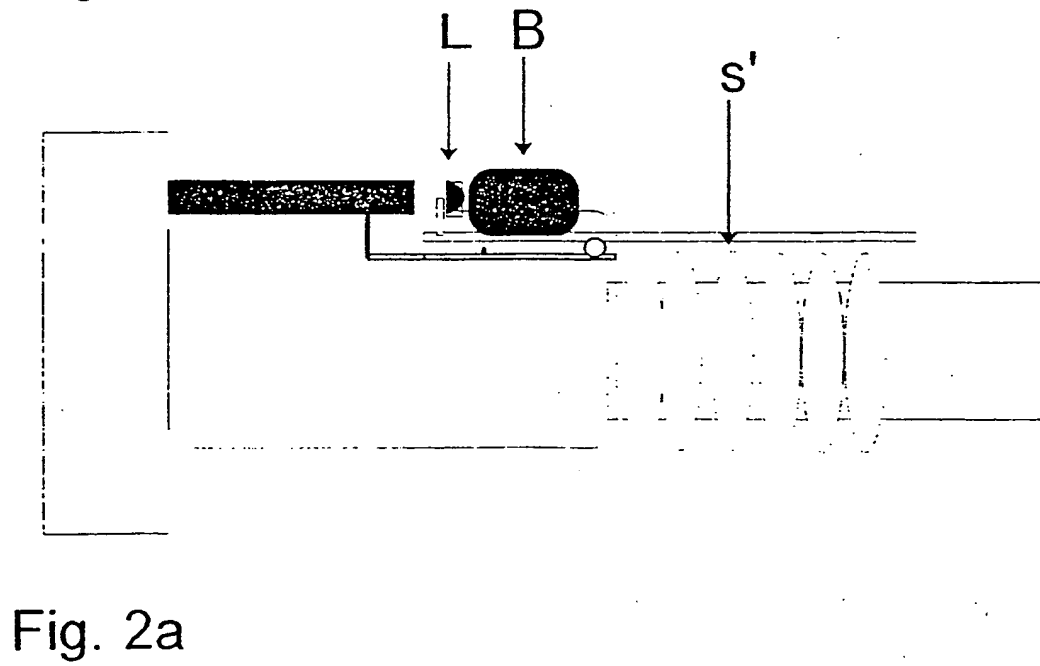
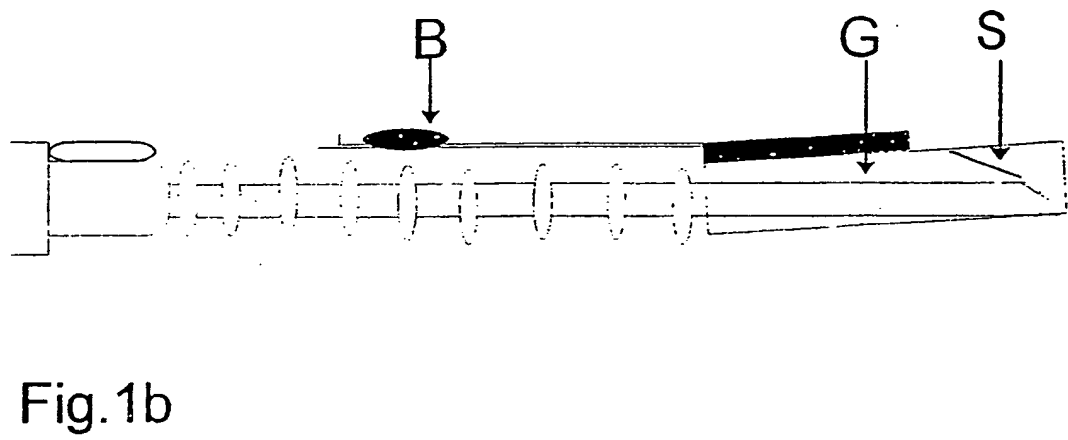
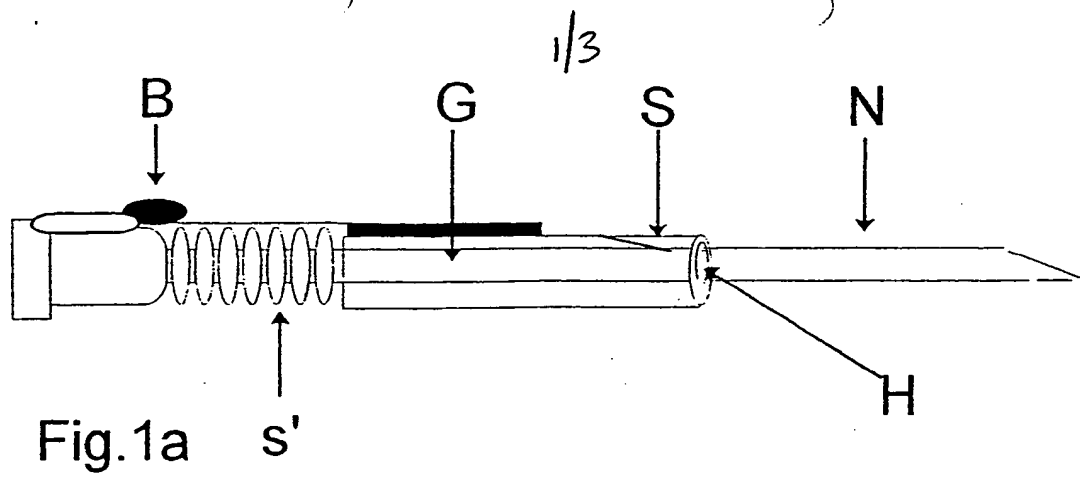
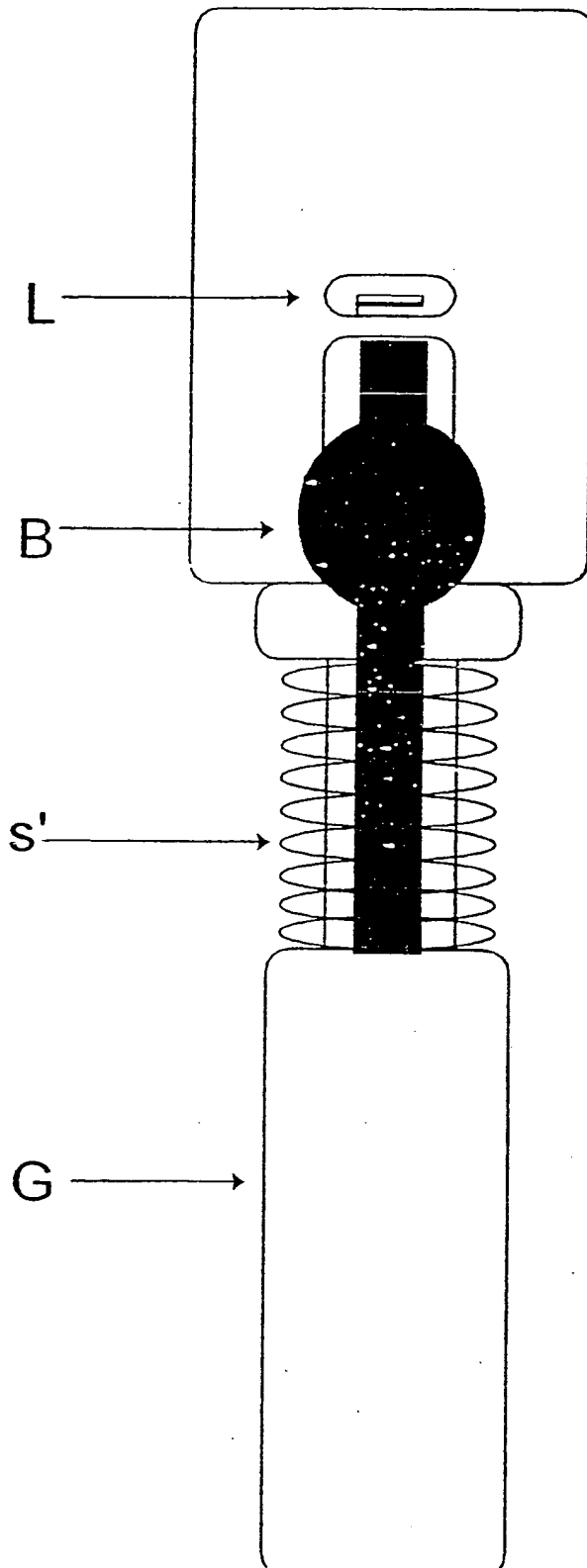
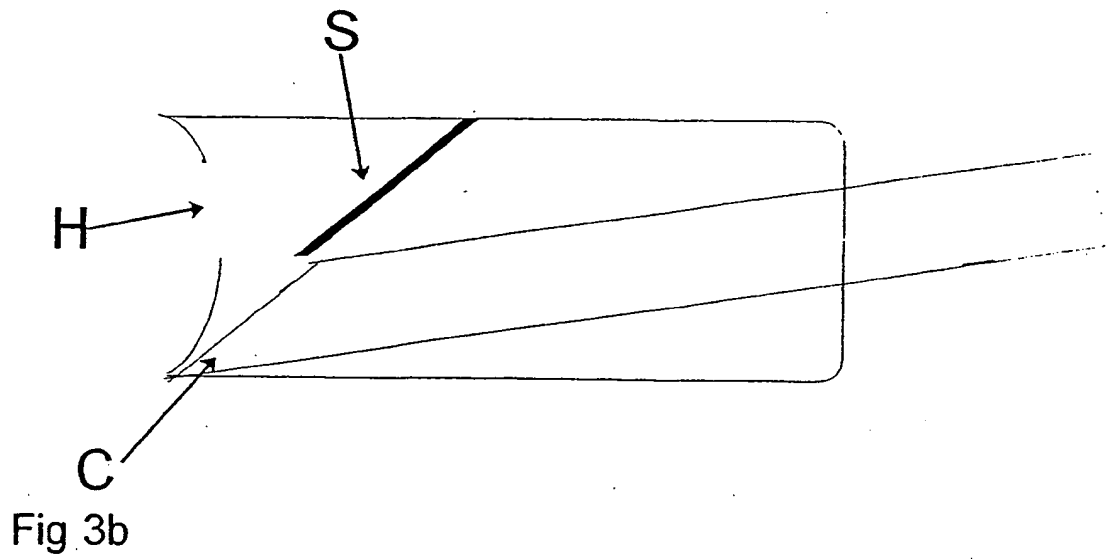
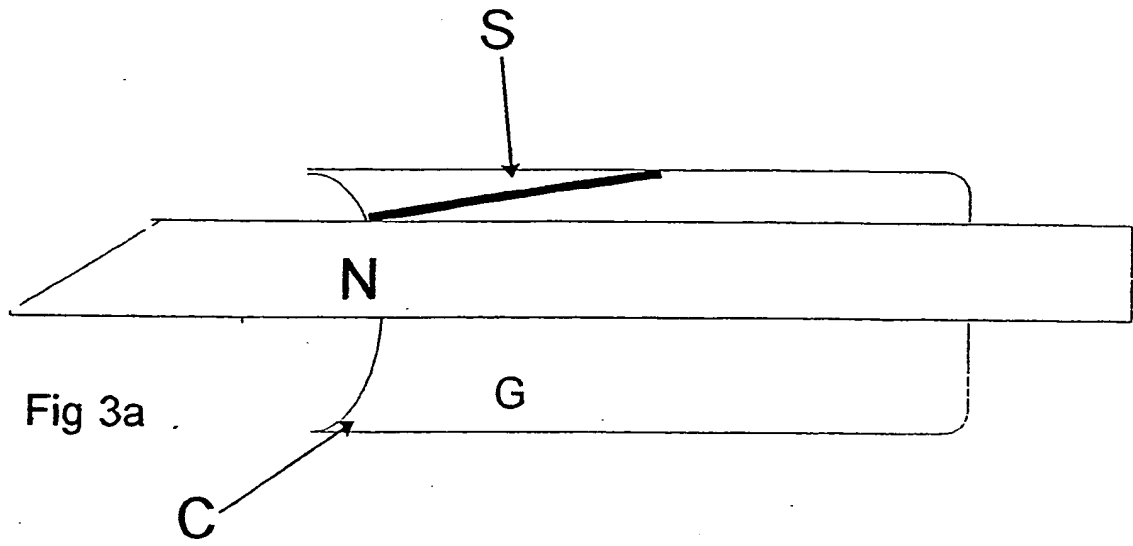


Fig.2b.



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The Integral Hypodermic Needle Guard

A device either a component of a hypodermic needle or a part that can be attached to the hypodermic needle prior to use (integral at time of use) which can be used as a guard to cover the needle tip immediately after use and so prevent any possibility of a needle stick injury.

Needle stick injuries are always a worry for medical staff as such an injury could transmit viral infections. With the HIV virus such an injury could cause a life threatening disease. To prevent such injuries medical staff wear gloves; however the sharp point of the hypodermic needle can easily penetrate these. Needle stick injuries may occur when they try to cover the needle after use, missing the sheath and pricking their fingers. In the emergency situation staff do not have to resheath or throw away used needles and they can be left lying around with the potential to cause a needle stick injury. Once the needle is thrown away the disposal box might be opened or spilt and a member of staff could be injured whilst tidying up the contents.

The integral Hypodermic Needle Guard was invented to ensure that immediately after blood has been taken the operator can cover the needle tip so preventing any possibility of further needlestick injuries.

The present invention provides a guard attached to the needle which can be used immediately after use to cover and protect the needle tip.

The guard can be a device made of any suitable material which is part of or can be attached to the needle prior to use which can be used by the operator immediately after the needle has been withdrawn from the injection site.

For example a circular sheath is described which encircles the shaft of the needle. The sheath could be made of any suitable material. The sheath has a concave circular disc attached to one end. A hole the diameter of the needle is made in one half of the circular disc. The needle passes through the sheath over the metal spring and out through the hole in the disc. The flat part of the needle tip has to be resting at the centre of the disc. The sheath and the disc combined forms the guard. As the guard is pushed over the end of the needle a small spring in the base of the guard pushes the needle tip up into the cleft between the disc and the sheath. The guard can be maintained in this position by several methods; for example a coiled spring attached to the hub of the needle and to the sheath so when extended the extended coiled spring would pull the guard back on the needle tip.

An example of the Integral Hypodermic Needle Guard with reference to the accompanying drawing in which:

Figure 1a Shows the whole needle plus guard(the outline of the guard is drawn). A coiled spring is attached to the hub of the needle and to the sheath.

Figure 1b Shows the sheath extended over the end of the needle. A spring in the base of the guard forces the needle tip into the cleft shown. The extended coiled spring will pull back on the guard and maintain the guard in place.

Figure 2a Shows the side view of the needle hub showing a clip mechanism keeping the spring compressed.

Figure 2b Shows the view from the top of the locking mechanism keeping the coiled spring compressed. The spring is released by compressing the button; using the button the guard is advanced by pushing it over the end of the needle against the force of the extended coiled spring.

Figure 3a Shows longitudinal section through the sheath and the needle. Note the spring at the base of the guard and the site of the hole from the front of the guard. The needle has to be positioned so the flat part of the needle tip lies against the middle of the hole at the front of the guard.

Figure 3b Shows a longitudinal section of the needle and the sheath after the sheath has been pushed over the needle tip. The point of the needle is trapped in the cleft between the sheath and the concave disc attached to the base of the sheath.

Referring to the drawing the guard is an integral part of the hypodermic needle so that the operator can push the guard (G in Fig 1) over the end of the needle so that the guard safely covers the point of the hypodermic needle tip.

The guard illustrated in Fig 1 is attached to the needle hub by a spring. The spring is kept compressed by a locking device (L in Fig 2a and 2b). The spring is released by depressing the button (B in Fig 2a and 2b). Once blood has been taken the operator releases the spring by pressing the button. The operator then pushes the guard over the end of the needle tip using the button provided.

The guard illustrated is a cylinder with a concave disc attached to the base at one end. The needle passes through the sheath and out through a hole in the concave disc which is positioned so that one edge of the hole (H in Fig 1a and Fig 2a) is at or beyond the centre of the disc. The flat side of the needle tip has to lie next to the central part of the hole.

When the guard is pushed over the tip of the needle the needle tip will slide into the cleft (C in Fig 3a) at the base of the guard. The needle is forced into the cleft by the use of a metal spring (S in Fig 3) positioned in the base of the guard which maintains the needle in the cleft. The guard is prevented from falling off by the force of the extended coiled spring (s' in fig 1b) which pulls the needle back and also keeps the guard in position so that the needle tip is covered and secured.



Claims

1. A device part of, or attached prior to use to, a hypodermic needle which can be used as a guard to cover the needle tip immediately after use. The device is therefore integral with the hypodermic needle at time of use.
2. The guard as in claim 1 can be made in various shapes of various materials.
3. The guard as claimed in claims 1 and 2 can be maintained in its position over the point of the hypodermic needle by various mechanisms following withdrawal from the injection site.
4. The device as claimed in preceding claims allows the operator to render safe the needle tip without any risk to the operator of a needle stick injury.

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**Relevant Technical Fields**

- (i) UK Cl (Ed.M) A5R (RGG)  
(ii) Int Cl (Ed.5) A61M 5/32

Search Examiner  
MISS M M KELMAN

Date of completion of Search  
26 November 1993

**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

Documents considered relevant following a search in respect of Claims :-  
1 to 4

(ii) ONLINE DATABASES: WPI

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- X: Document indicating lack of novelty or of inventive step. P: Document published on or after the declared priority date but before the filing date of the present application.  
Y: Document indicating lack of inventive step if combined with one or more other documents of the same category. E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.  
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| Category | Identity of document and relevant passages |  | Relevant to claim(s) |
|----------|--|--|----------------------|
| X        | GB 2262451 A                               | (TZE CHUEN NG) - see the claims and Figure 5                           | 1 to 4               |
| X        | GB 2252046 A                               | (STEYN) - see the claims and Figure 1                                  | 1 to 4               |
| X        | WO 90/07349 A1                             | (VADHER) - see page 18 line 6 to page 22, line 30                      | 1 to 4               |
| X        | US 5181524 A                               | (MEDICAL SAFETY PRODUCTS) - see column 6, line 34 to column 7, line 20 | 1 to 4               |
| X        | US 3884230 A                               | (WULFF) - see Figures 1 and 2  | 1 to 4               |

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